

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGEPCT Rule 92bis.1 and
Administrative Instructions, Section 42.

INTERNATIONAL BUREAU

Room 901
9th Floor, 33, Teheran Bld
Yongnam-dong
Jangnam-gu
Seoul 135-090
REPUBLIQUE DE COREE

Date of mailing (day, month, year)

10 July 2001 (20.07.01)

Applicant's or agent's file reference

OPP990787R

IMPORTANT NOTIFICATION

International application No.

PCT KR99 00750

International filing date (day, month, year)

05 December 1999 (08.12.99)

1. The following indication appeared in record concerning:

☒ the applicant☐ the inventor☐ the agent☐ the common representative

Name and Address

LG CHEMICAL LTD.
LG Twin Towers
20, Yoido-dong
Youngdungpo-gu
Seoul 150-721
Republic of Korea

State of Nationality

KR

State of Residence

KR

Telephone No.

Facsimile No.

Telexprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person☐ the name☐ the address☐ the nationality☐ the residence

Name and Address

LG CHEMICAL CO. LTD.
LG Twin Towers
20, Yoido-dong
Youngdungpo-gu
Seoul 150-721
Republic of Korea

State of Nationality

KR

State of Residence

KR

Telephone No.

Facsimile No.

Telexprinter No.

3. Further action must be taken by:

4. The applicant must submit the following:

☒ a power of attorney

the power of attorney must be signed by the applicant

the power of attorney must be signed by the applicant

☒ a statement of the inventor's declaration

the statement of the inventor's declaration must be signed by the inventor

the statement of the inventor's declaration must be signed by the inventor

The International Bureau of WIPO
41, chemin des Colombettes
1211 Geneva 20, Switzerland

Date of receipt of the notification

Date of receipt of the notification

Date of receipt of the notification

Date of receipt of the notification

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

PCT Rule 61.2i

From the INTERNATIONAL BUREAU

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C. 20231
 ETATS UNIS D'AMERIQUE

Date of mailing (day, month, year) 10 August 2000 (10/08/00)	
International application No. PCT KR99 00750	Applicant's or agent's file reference OPP990787KR
International filing date (day, month, year) 08 December 1999 (08/12/99)	Priority date (day, month, year) 08 December 1998 (08/12/98)
Applicant LEE Sang Young et al	

1. The applicant hereby elects the following country or countries:

☒ The applicant elects with the International Searching Authority, on
 07 July 2000 (07/07/00)

☐ The applicant elects the following country or countries:

☒ The applicant elects the following country or countries:

☐ The applicant elects the following country or countries:

The International Bureau of the World Intellectual Property Organization

INTERNATIONAL SEARCH REPORT

International application No.
PC7 KR99 00750**A. CLASSIFICATION OF SUBJECT MATTER**

IPC7 C08L 23/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08L 23/10, B29C47/00, H01M 2/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Patents and applications for inventions since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5385777 A (NETTO DENKO CORP.) 31 JAN 1995 (31 01 95) CITED IN THE APPLICATION, COLUMN 6 TO COLUMN 8	1 - 3, 10 - 12
Y	US 5480745 A (NETTO DENKO CORP.) 2 JAN 1996 (02 01 96) CITED IN THE APPLICATION, COLUMN 6 TO COLUMN 7	1 - 3, 10 - 12
A	US 4438185 A (CELANESE CORP.) 20 MAR 1984 (20 03 84), COLUMN 15	4 - 5, 13 - 14

☐ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document defining the general state of the art which is not considered to be of particular relevance	"Y" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Z" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents such combination being obvious to a person skilled in the art
"I" document which may throw doubt on priority claim(s) or which is cited to establish the publication date or citation or other special reason (as specified)	"K" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

14 MARCH 2000 (14 03 2000)

Date of mailing of the international search report

15 MARCH 2000 (15 03 2000)

Name and mailing address of the ISA/IKK

Korean Industrial Property Office
Government Complex, Jangjeon, Jamsil-dong, Songdo, Jangjeon
Metropolitan City 150-720, Republic of Korea

Authorized officer

CHO Hee Won

Facsimile No. 82-42-472714

Telephone No. 82-42-481-5507



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR99/00750

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5385777 A	31.01.95	DE 69304587 C T EP 565938 A B JP 5331306 A	17.10.96 20.10.93 14.12.93
US 5480745 A	02.01.96	DE 69500288 C T EP 668156 B JP 7216118 A	19.06.97 14.05.97 15.08.95
US 4438185 A	20.03.84	CA 1169118 A DE 3130069 A C FR 2488051 A B GB 2081604 A B JP 57055064 A JP 6019980 B US 4359510 A	12.06.84 04.03.82 27.04.84 11.07.84 01.04.82 16.03.94 16.11.82

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

To
KIM, Seong Ki

9th Fl., Teheran Bldg., 825-33 Yeoksam-dong, Kangnam-gu,
Seoul 135-080, KOREA

Date of mailing
(day month year) 13 APRIL 2001 (13 04 2001)

Applicant's or agent's file reference OPP99078KR	IMPORTANT NOTIFICATION
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International application No PCT/KR99/00750	International filing date (day month year) 08 DECEMBER 1999 (08 12 1999)	Priority date (day month year) 08 DECEMBER 1998 (08 12 1998)
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Applicant
LG CHEMICAL LTD. et al

- The applicant is hereby notified that International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
- A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
- Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
- REMINDER**
The applicant must enter the national phase before each elected office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB 301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details in the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA KR Korean Intellectual Property Office Government Complex 1, Yeoncheon-dong, Songye-district Metropolitan City 302-700, Republic of Korea Telephone No. 82-42-472-7774	Authorized officer COMMISSIONER K Telephone No. 82-42-480-855
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PATENT COOPERATION TREATY

PCT


INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference OPP99078KR	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPC/EA 416)
International application No PCT/KR99/00750	International filing date (day month year) 08 DECEMBER 1999 (08 12 1999)	Priority date (day month year) 08 DECEMBER 1998 (08 12 1998)	
International Patent Classification (IPC) or national classification and IPC IPC7 C08L 23/10, H01M 2/14, B32B 27/08, B01D 67/00, B29C 47/06			
Applicant LG CHEMICAL LTD et al			

- 1 This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36
- 2 This REPORT consists of a total of 4 sheets, including this cover sheet
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT)
- These annexes consist of a total of _____ sheets

- 3 This report contains indications relating to the following items:
- I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
 - VI ☒ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 07 JULY 2000 (07 07 2000)	Date of completion of this report 11 APRIL 2001 (11 04 2001)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office Government Complex, 1st floor, Dunsan-dong, Seokcho, District Metropolitan City 302-710, Republic of Korea Telephone No. 82-42-412-7143 Fax No. 82-42-412-7144 E-mail PCT/PEA 416, cover sheets, etc. 1998	Authorized officer Chang Hee Won Telephone No. 82-42-48-5996 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCI KR99 00750

1 Basis of the report

1 With regard to the elements of the international application *

- ☒ the international application as originally filed
- ☐ the description
 pages _____ as originally filed
 pages _____ filed with the demand
 pages _____ filed with the letter of _____
- ☐ the claims
 pages _____ as originally filed
 pages _____ as amended (together with any statement) under Article 19
 pages _____ filed with the demand
 pages _____ filed with the letter of _____
- ☐ the drawings
 pages _____ as originally filed
 pages _____ filed with the demand
 pages _____ filed with the letter of _____
- ☐ the sequence listing part of the description
 pages _____ as originally filed
 pages _____ filed with the demand
 pages _____ filed with the letter of _____

2 With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item

These elements were available or furnished to this Authority in the following language _____ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b))
- ☐ the language of publication of the international application (under Rule 48.3(b))
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and or 55.3)

3 With regard to any **nucleotide** and/or **amino acid** sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing

- ☐ contained in the international application in written form
- ☐ filed together with the international application in computer readable form
- ☐ furnished subsequently to this Authority in written form
- ☐ furnished subsequently to this Authority in computer readable form
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4 ☐ The amendments have resulted in the cancellation of

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet _____

5 ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box: Rule 70.2(c) **

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 17.4 are referred to in this opinion as "originally filed" and are not indexed in this report since they do not contain amendments but are "not in force".

** Replacement sheets containing such amendments must be referred to under item 4 and indexed in this report.

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT KR99 00750

V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement

1 Statement

Novelty (N)	Claims	1-19	YES
	Claims		NO
Inventive step (IS)	Claims	1-19	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

2 Citations and explanations (Rule 70.7)

The invention refers to a separator for secondary battery and porous film made of polyolefin blend and process for preparing the same characterized in that the porous film is manufactured by molding a film with a mixed blend containing two or more of polyolefins by using a casting or film blowing, and that a porous film is manufactured by annealing and stretching the molded film, and that the porous film is surface treated by irradiating it with ionizing radiation.

D1 (US A 5480745) discloses that a porous laminated film formation with polyethylene and polypropylene can be conducted by T-die extrusion or blown-film extrusion and the film is annealed and stretched.

D2 (US A 5,385,777) discloses a porous single film and a method for manufacturing the same by molding a film with polyethylene and polypropylene melt-mixed and extruded from a T-die extruder.

However, the prior art does not suggest or teach surface treatment by irradiating it with ionizing radiation, so that surface treatment by irradiating improves the hydrophilicity and mechanical properties of the film by irradiating energized particles on the film. There is no indication that surface treatment by irradiating is used as such.

Therefore, the subject matter of claims 1-19 is new and the claim meets the requirements of Article 33(2) PCT with regard to the requirement for novelty. Further, the surface treatment by irradiating according to claims 1-19 is not obvious to a person skilled in the art. Thus, the subject matter of claims 1-19 does involve an inventive steps in the sense of Article 33(3) PCT.

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR99/00750

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

<u>Application No. Patent No.</u>	<u>Publication date (day month year)</u>	<u>Filing date (day month year)</u>	<u>Priority date (valid claim) (day month year)</u>
US-A-5385777	31-01-1995	30-03-1993	30-03-1992(JP) 11-01-1993(JP)
US-A-5480745	02-01-1996	31-01-1995	31-01-1994(JP)

2. Non-written disclosures (Rule 70.9)

<u>Kind of non-written disclosure</u>	<u>Date of non-written disclosure (day month year)</u>	<u>Date of written disclosure referring to non-written disclosure (day month year)</u>
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PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) OPP/00757KR

Box No. I TITLE OF INVENTION	
SEPARATOR FOR SECONDARY BATTERY AND POROUS FILM MADE OF POLYOLEFIN BLEND AND PROCESS FOR PREPARING THE SAME	
Box No. II APPLICANT	
Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country of residence if no State of residence is indicated below.)	
LG CHEMICAL LTD.	<input type="checkbox"/> This person is also inventor
LG Twin Towers, 20 Yoido-dong, Yongdunipo-gu,	Telephone No. 012-863-2072
Seoul, 150-721 Republic of Korea	Facsimile No. 012-863-2050
State (that is, country) of nationality: KR	State (that is, country) of residence: KR
This person is applicant for the purposes of <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country of residence if no State of residence is indicated below.)	
LEE, Sang-Young	This person is
LG Chemical Apt. B-105, Daejeon-dong 181-22,	<input type="checkbox"/> applicant only
Yuseong-gu, Taejeon city, 305-380	<input checked="" type="checkbox"/> applicant and inventor
Republic of Korea	<input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of nationality: KR	State (that is, country) of residence: KR
This person is applicant for the purposes of <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby has been appointed to act on behalf of the applicant(s) before the competent International Authorities as <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country)	
KIM, Seung-Ri	Telephone No. 011-263-1111
20, Teongdeon, 141-1,	Facsimile No. 011-263-1112
Yongnam, 141-2, Kwanak-gu,	Teleprinter No.
Seoul 150-721 Republic of Korea	
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent	

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

AHN, Byoung-In
 Lucky Dormitory 401, Doryoung-dong 381-1,
 Yuseong-gu, Taejeon-city, 305-340
 Republic of Korea

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality: KR

State (that is, country) of residence: KR

This person is applicant for the purposes of

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

SONG, Heon-Sik
 LG Chemical Apt. 9 502, Doryoung-dong 381-1,
 Yuseong-gu, Taejeon-city, 305-340
 Republic of Korea

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality: KR

State (that is, country) of residence: KR

This person is applicant for the purposes of

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

KIM, Myung-Man
 Sangrokco Apt. 108-1408, Maemyun-dong,
 Seo-gu, Taejeon-city, 302-105
 Republic of Korea

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality: KR

State (that is, country) of residence: KR

This person is applicant for the purposes of

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address (Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet

Box No. V DESIGNATION C H E T E S

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☐ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line).

- | | |
|---|---|
| <input type="checkbox"/> AL Albania | <input type="checkbox"/> LS Lesotho |
| <input type="checkbox"/> AM Armenia | <input type="checkbox"/> LT Lithuania |
| <input type="checkbox"/> AT Austria | <input type="checkbox"/> LU Luxembourg |
| <input type="checkbox"/> AU Australia | <input type="checkbox"/> LV Latvia |
| <input type="checkbox"/> AZ Azerbaijan | <input type="checkbox"/> MD Republic of Moldova |
| <input type="checkbox"/> BA Bosnia and Herzegovina | <input type="checkbox"/> MG Madagascar |
| <input type="checkbox"/> BE Barbados | <input type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input type="checkbox"/> BG Bulgaria | <input type="checkbox"/> MN Mongolia |
| <input type="checkbox"/> BR Brazil | <input type="checkbox"/> MW Malawi |
| <input type="checkbox"/> BY Belarus | <input type="checkbox"/> MX Mexico |
| <input type="checkbox"/> CA Canada | <input type="checkbox"/> NO Norway |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CN China | <input type="checkbox"/> PL Poland |
| <input type="checkbox"/> CU Cuba | <input type="checkbox"/> PT Portugal |
| <input type="checkbox"/> CZ Czech Republic | <input type="checkbox"/> RO Romania |
| <input type="checkbox"/> DE Germany | <input type="checkbox"/> RU Russian Federation |
| <input type="checkbox"/> DK Denmark | <input type="checkbox"/> SD Sudan |
| <input type="checkbox"/> EE Estonia | <input type="checkbox"/> SE Sweden |
| <input type="checkbox"/> ES Spain | <input type="checkbox"/> SG Singapore |
| <input type="checkbox"/> FI Finland | <input type="checkbox"/> SI Slovenia |
| <input type="checkbox"/> GB United Kingdom | <input type="checkbox"/> SK Slovakia |
| <input type="checkbox"/> GD Grenada | <input type="checkbox"/> SL Sierra Leone |
| <input type="checkbox"/> GE Georgia | <input type="checkbox"/> TJ Tajikistan |
| <input type="checkbox"/> GH Ghana | <input type="checkbox"/> TM Turkmenistan |
| <input type="checkbox"/> GM Gambia | <input type="checkbox"/> TR Turkey |
| <input type="checkbox"/> HR Croatia | <input type="checkbox"/> TT Trinidad and Tobago |
| <input type="checkbox"/> HU Hungary | <input type="checkbox"/> UA Ukraine |
| <input type="checkbox"/> ID Indonesia | <input type="checkbox"/> UG Uganda |
| <input type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> US United States of America |
| <input type="checkbox"/> IN India | <input type="checkbox"/> UZ Uzbekistan |
| <input type="checkbox"/> IS Iceland | <input type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> JP Japan | <input type="checkbox"/> YU Yugoslavia |
| <input type="checkbox"/> KE Kenya | <input type="checkbox"/> ZW Zimbabwe |
| <input type="checkbox"/> KG Kyrgyzstan | |
| <input type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input type="checkbox"/> KR Republic of Korea | |
| <input type="checkbox"/> KZ Kazakhstan | |
| <input type="checkbox"/> LC Saint Lucia | |
| <input type="checkbox"/> LK Sri Lanka | |
| <input type="checkbox"/> LR Liberia | |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that these additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the confirmation and confirmation fee. Confirmation must reach the receiving Office within the 15-month time limit.


Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) 08 December 1998 (08. 12. 98.)	1998-53667	FR		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

* Where the earlier application is an ANPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.1(b)(ii)). See Supplemental Box

Box No. VII INTERNATIONAL SEARCHING AUTHORITY			
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):	
ISA / FR		Date (day/month/year)	Number Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 13 claims : 4 abstract : 1 drawings : sequence listing part of description : Total number of sheets : 22	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):
Figure of the drawings which should accompany the abstract:	Language of filing of the international application: Korean

Box No. IX SIGNATURE OF APPLICANT OR AGENT	
Near to each signature, indicate the name of the person signing and the capacity in which the person signs if such capacity is not obvious from reading the request.	
KIM, Seong-Ki	

For receiving Office use only	
1. Date of actual receipt of the purported international application:	2. Drawings:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	<input type="checkbox"/> received
4. Date of timely receipt of the required corrections under PCT Article 17(2):	<input type="checkbox"/> not received
5. International Searching Authority (if two or more are competent): ISA	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference OPP990787KR	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA 220) as well as, where applicable, item 5 below	
International application No PCT/KR99/00750	International filing date (day month year) 08 DECEMBER 1999 (08 12 1999)	(Earliest) Priority Date (day month year) 08 DECEMBER 1998 (08 12 1998)
Applicant LG CHEMICAL LTD et al		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form
- ☐ filed together with the international application in computer readable form
- ☐ furnished subsequently to this Authority in written form
- ☐ furnished subsequently to this Authority in computer readable form
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable.** (See Box I)

3. ☐ **Unity of invention is lacking.** (See Box II)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant
- ☐ the text has been established according to Rule 38.2(b) by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawing** to be published with the abstract is figure No. _____

- ☐ is suggested by the applicant
- ☐ because the applicant failed to suggest a figure
- ☐ because this figure better characterizes the invention
- ☒ None of the figures

A. CLASSIFICATION OF SUBJECT MATTER**IPC 7 C08L 23/10**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08L 23/10, B29C47/00, H01M 2/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	US 5385777 A (NITTO DENKO CORP.) 31 JAN 1995 (31-01-95) CITED IN THE APPLICATION, COLUMN 6 TO COLUMN 8	1-3, 10-12
Y	US 5480745 A (NITTO DENKO CORP.) 2 JAN 1996 (02-01-96) CITED IN THE APPLICATION, COLUMN 6 TO COLUMN 7	1-3, 10-12
A	US 4438785 A (CHIANESE CORP.) 20 MAR 1984 (20-03-84), COLUMN 15	4-5, 13-14

☐ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"O" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"C" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"N" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"I" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"X" document member of the same patent family

Date of the actual completion of the international search

14 MARCH 2000 (14-03-2000)

Date of mailing of the international search report

15 MARCH 2000 (15-03-2000)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Laeon, Daejeon-dong, Songju-1-dong
Metropolitan City, 305-701, Republic of Korea

Telephone No. 82-42-4727114

Authorized officer:

Choi Hee Won

Telephone No. 82-42-48-4337



INTERNATIC SEARCH REPORT

Information on patent family members

International application No.

PCT/KR99/00750

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5385777 A	31.01.95	DE 69304587 C T	17.10.96
		EP 565938 A B	20.10.93
		JP 5331306 A	14.12.93
US 5480745 A	02.01.96	DE 69500288 C T	19.06.97
		EP 668156 B	14.05.97
		JP 7216118 A	15.08.95
US 4438185 A	20.03.84	CA 1169118 A	12.06.84
		DE 3130069 A C	04.03.82
		FR 2488951 A B	27.04.84
		GB 2081604 A B	11.07.84
		JP 57055064 A	01.04.82
		JP 6019980 B	16.03.94
		US 4359510 A	16.11.82

1998 年 1 月 1 日

1 1

KIM, Seong Ki

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Kangnam-gu, Seoul 135-080, KOREA

PCT

국세조사부 고시 제 11-1-1호 국세조사부 고시
부속심신언서 송부 통칙서

(PCT 및 식 44.1)

$$\begin{pmatrix} 1 & 1 \\ 0 & 0 \end{pmatrix}$$

16 MARCH 2000 (16.03.2000)

출원인 또는 대리인 서명/인
OPP990787KR

이후 이 분야에 대해; 이 때 1 및 4 점.

PCT/KR99/00750

08 DECEMBER 1999 (08.12.1999)

100

LG CHEMICAL LTD et al

1. ☒ 본 명세서에서 사용된 모든 용어는 본 명세서에서 정의된 바와 같다.
 주이 제19조의 규정에 의한 보정지 및 설명지의 제출:
 당국에, 본 명세서에 기재된 모든 사항을 보정지 및 설명지에 기재하는 등, 당국에 2014년 11월 14일 46g
 기간 내에 제출하여야 한다. (보정지 및 설명지는 본 명세서에 기재된 2014년 11월 14일 46g
 기한을 초과하여 제출된 서류(NOT))는 없다.
 제출지: WIPO 국제사무소
 34, chemin des Colombettes
 1211, Geneva 20, Switzerland
 팩스번호: (41-22) 740 14 35
 보다 자세한 지침에 대하여는, 본 명세서에 기재된 설명서를 참조한다.

2. ☐ 본 명세서에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에 2014년 11월 14일 46g
 기한 내에 제출한다.

3. ☐ 본 명세서에 10.2 및 10.3항에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에
 2014년 11월 14일 46g
☐ 본 명세서에 10.2 및 10.3항에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에
 2014년 11월 14일 46g
☐ 본 명세서에 10.2 및 10.3항에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에
 2014년 11월 14일 46g

4. ☐ 본 명세서에 10.2 및 10.3항에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에
 2014년 11월 14일 46g
☐ 본 명세서에 10.2 및 10.3항에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에
 2014년 11월 14일 46g
☐ 본 명세서에 10.2 및 10.3항에 기재된 모든 사항을 보정지 및 설명지에 기재하여 본 명세서에
 2014년 11월 14일 46g

[illegible]

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83-43-470-7140

$$S^2 = 4^2 - 484 = 512$$

POLYMER 2004, 1998, 1-10



